TG: @Chalnaayaaar

Exercise - I (Conceptual Questions) Build Up Your Understanding

1. Which is odd –
(1) Chitin – Carbohydrate
(2) Pectin - Protein
(3) Steroid – Lipid
(4) Wax - Lipid

2. Which is a disaccharide?
(1) Galactose (2) Fructose
(3) Maltose (4) Dextrin

3. Sugar found in haemolymph of insects is called-
(1) Maltose (2) Lactose
(3) Trehalose (4) Galactose

4. Carbohydrates are stored in mammals as:
(1) Glucose in liver
(2) Glycogen in muscles and spleen
(3) Lactic acid in muscles
(4) Glycogen in liver and muscles

5. Translocation of sugars in flowering plants occur in the form of -
(1) Glucose (2) Sucrose
(3) Fructose (4) Maltose

6. Sucrose is composed of -
(1) Glucose & Fructose
(2) Glucose & Glycogen
(3) Two molecules of Glucose
(4) Glycogen & Fructose

7. Sugars with five membered ring are called -
(1) Pyranose (2) Furanose
(3) Dextrorotatory (4) Levorotatory

8. Amylose and Amylopectin chains occur in -
(1) Glycogen (2) Starch
(3) Cellulose (4) Chitin

9. Which of the following disaccharide gives two molecules of glucose on hydrolysis?
(1) Maltose (2) Lactose
(3) Both (1) and (2) (4) Sucrose

10. All lipids are -
(1) Composed of fatty acids
(2) Triglycerides
(3) Insoluble in water (4) All the above

11. Proteins present in protoplasm are very important because-
(1) They provide definite shape to cell
(2) They function as biocatalyst
(3) They yield energy
(4) They are stored food

12. Unit of protein is: -
(1) Amino acid (2) Monosaccharide
(3) NH_3 (4) Nucleotide

13. Milk protein is-
(1) Lactogen (2) Myosin
(3) Casein (4) Pepsin

14. The amino acids which are not synthesized in the body are called:
(1) Non-essential
(2) Essential
(3) Deaminated
(4) All of them

15. For body growth and repair, one needs:
(1) Carbohydrates (2) Fats
(3) Proteins (4) Vitamins

16. Proteins in the body are composed of: -
(1) Amino acids (2) Natural proteins
(3) Enzymes (4) nucleic acids

17. Which is most important structural part of the body?
(1) Protein (2) Carbohydrates
(3) Lipid (4) Nucleic acid

18. Histone is a basic protein due to -
(1) Alanine & glycine
(2) Methionine & serine
(3) Tryptophan & tyrosine
(4) Lysine & Arginine

19. Nucleic acids are made up of -
(1) Amino acids (2) Pentose sugars
(3) Glycerol (4) Nucleotides

20. Circular and double stranded DNA occurs in
(1) Golgi body (2) Mitochondria
(3) Nucleus (4) ER

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21. Double helix model of DNA was proposed by-
(1) Watson and Crick
(2) Schleiden and Schwann
(3) Singer and Nicolson
(4) Kornberg and Khorana

22. Back bone in structure of DNA molecule is made up of -
(1) Pentose Sugar and phosphate
(2) Hexose sugar and phosphate
(3) Purine and pyrimidine
(4) Sugar and phosphate

23. Nucleotide is -
(1) N - base, pentose sugar and phosphoric acid
(2) Nitrogen, Hexose sugar and phosphoric acid
(3) Nitrogen base, pentose sugar
(4) Nitrogen base, trioses and phosphoric acid

24. Which element is not found in nitrogenous base?
(1) Nitrogen (2) Hydrogen
(3) Carbon (4) Phosphorus

25. A N-base together with pentose sugar and phosphate forms: -
(1) Nucleoside (2) Polypeptide
(3) Nucleotide (4) Amino acid

26. The purine & pyrimidine pairs of complementary strands of DNA are held together by –
(1) H – bonds (2) O – bonds
(3) C – bonds (4) N – bonds

27. On an average, how many purine N bases are present in single coil of DNA?
(1) Four (2) Five
(3) Ten (4) Uncertain

28. ATP is-
(1) Nucleotide (2) Nucleoside
(3) Nucleic acid (4) Vitamin

29. In DNA, purine nitrogen bases are: -
(1) Uracil and Guanine
(2) Guanine and Adenine
(3) Adenine and cytosine
(4) None

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30. Adenylic acid is: -
(1) Ribose + Adenosine + phosphate
(2) Ribose + cytosine
(3) Nucleoside
(4) Deoxyribonucleotide

31. The Watson-Crick model of DNA double helix was proposed in :-
(1) 1953 (2) 1963
(3) 1954 (4) 1952

32. The fastest acting enzyme, in the biological kingdom among the following is: -
(1) Lipase
(2) Amylase
(3) Peptidase
(4) Carbonic anhydrase

33. Apoenzyme is:
(1) Protein (2) Vitamin
(3) Carbohydrate (4) Amino acid

34. Which of the following inactivates the enzyme by changing its shape?
(1) Competitive inhibitor
(2) Allosteric inhibitor
(3) Coenzyme (4) All of the above

35. Enzyme were discovered for the first time in: -
(1) Bacteria (2) Yeast
(3) Algae (4) Spinach

36. What is NADP?
(1) An enzyme
(2) An ion carrier
(3) H acceptor coenzyme
(4) A part of t-RNA

37. The cofactor of various respiratory enzymes is: -
(1) Ca (2) B
(3) Mg (4) Mo

38. Most enzymes consist of two parts these are
(1) Enzyme & substrate
(2) Enzyme & coenzyme
(3) Apoenzyme and enzyme
(4) Apoenzyme & cofactor

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39. The first enzyme isolated in crystalline form was
(1) Catalase (2) Urease
(3) Peroxidase (4) Amylase

40. In plants, enzymes are present: -
(1) Only in flowers
(2) Only in leaves
(3) In all the living cells
(4) Only in parenchyma

41. Enzyme inhibition caused by a substrate analogue is: -
(1) Competitive (2) Non-competitive
(3) In competitive (4) Semi-competitive

42. Allosteric enzymes have allosteric sites for
(1) Inhibition only
(2) Activation only
(3) Reduction in activation energy
(4) Both activation and inhibition

ENZYME : Introduction to the living state

43. An example of competitive inhibition is :
(1) Succinic dehydrogenase by malonic acid
(2) Cytochrome oxidase by cyanide
(3) Hexokinase by glucose - 6 phosphate
(4) Carbonic anhydrase by carbon - dioxide

44. First discovered Enzyme was :-
(1) Isomerase (2) Transaminase
(3) Zymase (4) Transferase

45. Enzyme were discovered for the first time in :-
(1) Bacteria (2) Yeast
(3) Algae (4) Spinach

46. Who coined the term enzyme ?
(1) Pasteur (2) Buchner
(3) Kuhne (4) Sumner

47. Vitamin serves the function of :-
(1) An enzyme (2) A coenzyme
(3) A holoenzyme (4) A hormone

48. Which of the following is a coenzyme ?
(1) NAD (2) NADP
(3) FAD (4) All the above

49. The first enzyme isolated in crystalline form was :-
(1) Catalase (2) Urease
(3) Peroxidase (4) Amylase

50. In plants enzymes are present in :-
(1) Only in flowers
(2) Only in leaves
(3) All the living cells
(4) Only in parenchyma

51. Which of the following coenzyme is a derivative of Niacin ?
(1) NAD (2) NADP
(3) FAD (4) Both (1) and (2)

52. Which of the following is not consumed in a biochemical process ?
(1) Hormones (2) Enzymes
(3) Vitamins (4) Nucleotides

53. How the presence of an enzyme affects the activation energy of a reaction ?
(1) It becomes increased
(2) It becomes decreased
(3) It is first increased and then decreased
(4) It is not affected at all

54. Enzyme inhibition caused by a substrate analogue is :-
(1) Competitive
(2) Non-competitive
(3) In competitive
(4) Semi-competitive

55. At boiling temperature of water, what will be effect on an enzyme :-
(1) become denatured
(2) remain unaffected
(3) become inactivated
(4) become more active

56. Enzyme have very narrow optima for :-
(1) Light (2) Temperature
(3) pH (4) Humidity

57. Which enzyme is not a protein ?
(1) Hexokinase (2) Synthetase
(3) Endonuclease (4) Ribozyme

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58. Allosteric enzymes have allosteric sites for:-
(1) Inhibition only
(2) Activation only
(3) Reduction in activation energy
(4) Both inhibition and activation

59. Substrate concentration at which an enzyme attains half of its max. velocity is ?
(1) Half life of enzyme
(2) Km-constant of enzyme
(3) Concentration ratio
(4) Turn over numer (TON) of enzyme

60. Which of the following statements regarding enzyme inhibition is correct ?
(1) Non-competitive inhibition of an enzyme can be overcome by adding large amount of substrate
(2) Competitive inhibition is seen, when a substrate competes with an enzyme for binding to an inhibitor protein
(3) Competitive inhibition is seen, when the substrate and the inhibitor compete for the active site on the enzyme
(4) Non-competitive inhibitors often bind to the enzyme irreversibly.

61. The catalytic efficiency of two different enzyme can be compared by the :
(1) The Km value
(2) The pH optimum value
(3) Formation of the product
(4) Molecular size of the enzyme

62. Which of the following is/are structural analogue(s) of p-amino benzoic acid?
(1) Malonate
(2) Glucose-6-phosphate
(3) AMP
(4) Sulpha drugs

EXERCISE-I (Conceptual Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	2	3	3	4	2	1	2	2	1	3	2	1	3	2	3
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	1	1	4	4	2	1	1	1	4	3	1	3	1	2	1
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	1	4	1	2	2	3	3	4	2	3	1	4	1	3	2
Question	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Answer	3	2	4	2	3	4	2	2	1	1	3	4	4	2	3
Question	61	62													
Answer	1	4													

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Exercise - II (Previous Year Questions) AIPMT/NEET

AIPMT 2006

1. An organic substance bound to an enzyme and essential for its activity is called
(1) Apoenzyme (2) Isoenzyme
(3) Coenzyme (4) Holoenzyme

AIPMT 2007

2. Which monosaccharide does not show optical isomerism :
(1) Dihydroxy acetone
(2) Glyceraldehyde
(3) Erythrose
(4) Ribose

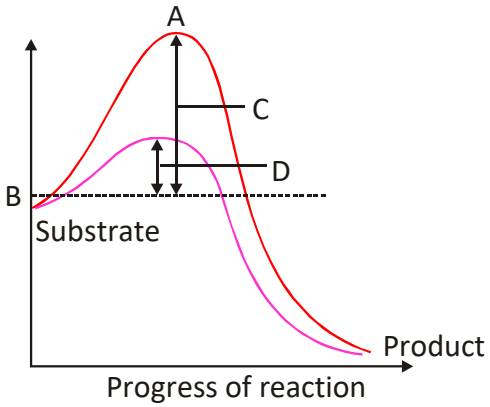
3. Which one of the following is not a constituent of cell membrane ?
(1) Phospholipids (2) Cholesterol
(3) Glycolipids (4) Proline

AIPMT 2008

4. A competitive inhibitor of succinic dehydrogenase is :-
(1) α-ketoglutarate (2) Malate
(3) Malonate (4) Oxaloacetate

AIPMT-Mains 2010

5. The figure given below shows the conversion of a substrate into product by an enzyme. In which one of the four options (1-4) the components of reaction labelled as A, B, C and D are identified correctly?



Options :

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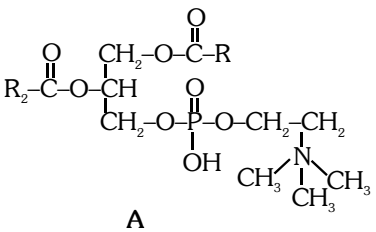
	A	B	C	D
(1)	Transition State	Potential energy	Activation energy without enzyme	Activation energy with enzyme
(2)	Potential Energy	Transition state	Activation energy with enzyme	Activation energy without enzyme
(3)	Activation energy with enzyme	Transition state	Activation energy without enzyme	Potential Energy
(4)	Potential Energy	Transition state	Activation energy with enzyme	Activation energy without enzyme

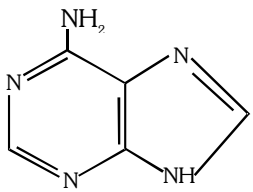
6. Three of the following statements about enzymes are correct and one is wrong. Which one is wrong?
(1) Enzymes are denatured at high temperatures but in certain exceptional organisms they are effective even at temperatures 80°-90°C
(2) Enzymes are highly specific
(3) Most enzymes are proteins but some are lipids
(4) Enzymes require optimum pH for maximal activity

AIPMT (Pre.) 2011

7. Which one of the following structural formulae of two organic compounds is correctly identified along with its related function ?



A



B

(1) B : adenine - a nucleotide that makes up nucleic acids
(2) A : Triglyceride - major source of energy
(3) B : Uracil - a component of DNA
(4) A : Lecithin - a component of cell membrane

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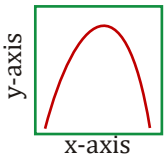
8. The curve given below shows enzymatic activity with relation to three conditions (pH, temperature and substrate concentration)



What do the two axises (x and y) represent ?

	x-axis	**y-axis**
(1)	Enzymatic activity	pH
(2)	Temperature	Enzyme activity
(3)	Substrate concentration	Enzymatic activity
(4)	Enzymatic activity,	Temperature

AIPMT-Mains 2012

9. For its activity, carboxypeptidase requires :-

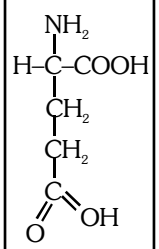
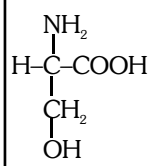
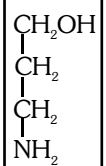
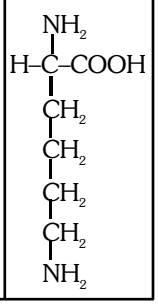
(1) Niacin (2) Copper
(3) Zinc (4) Iron

AIPMT (Pre.) 2012

10. Which one of the following sets of monosaccharides forms sucrose?

(1) β-D-Glucopyranose and α-D-fructofuranose
(2) α-D-Glucopyranose and β-D-fructopyranose
(3) α-D-Galactopyranose and α-D-Glucopyranose
(4) α-D-Glucopyranose and β-D-fructofuranose

11. Which one out of A - D given below correctly represents the structural formula of the basic amino acid ?

A	B	C	D
			

Options:

(1) A (2) B (3) C (4) D

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12. Which one is the most abundant protein in the animal world ?

(1) Collagen (2) Insulin
(3) Trypsin (4) Haemoglobin

NEET-UG 2013

13. The most abundant intracellular cation is :

(1) K^+ (2) Na^+ (3) Ca^{++} (4) H^+

14. Macro molecule chitin is :

(1) Simple polysaccharide
(2) Nitrogen containing polysaccharide
(3) Phosphorus containing polysaccharide
(4) Sulphur containing polysaccharide

15. Transition state structure of the substrate formed during an enzymatic reaction is :

(1) permanent and stable
(2) transient but stable
(3) permanent but unstable
(4) transient and unstable

16. The essential chemical components of many coenzymes are :

(1) Vitamins (2) Proteins
(3) Nucleic acids (4) Carbohydrates

AIPMT 2014

17. Which one of the following is a non - reducing carbohydrate ?

(1) Maltose (2) Sucrose
(3) Lactose (4) Ribose

AIPMT 2015

18. Which one of the following statements in incorrect?

(1) In competitive inhibition, the inhibitor molecule is not chemically changed by the enzyme.
(2) The competitive inhibitor does not affect the rate of breakdown of the enzyme-substrate complex.
(3) The presence of the competitive inhibitor decreases the Km of the enzyme for the substrate.
(4) A competitive inhibitor reacts reversibly with the enzyme to form an enzyme inhibitor complex.

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Re-AIPMT 2015

19. The chitinous exoskeleton of arthropods is formed by the polymerisation of :
(1) lipoglycans
(2) keratin sulphate and chondroitin sulphate
(3) D-glucosamine
(4) N-acetyl glucosamine

NEET-I 2016

20. One of the major components of cell wall of most fungi is :-
(1) Chitin (2) Peptidoglycan
(3) Cellulose (4) Hemicellulose

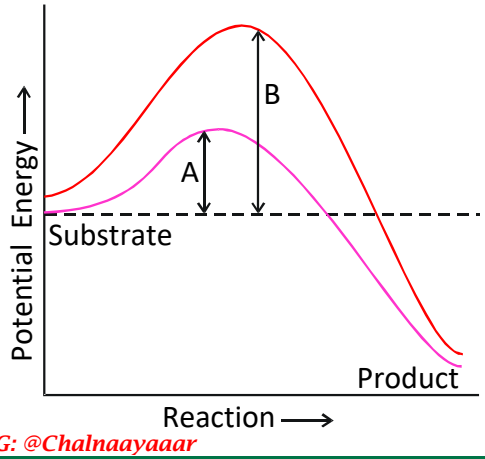
21. A typical fat molecule is made up of :-
(1) Three glycerol molecules and one fatty acid molecule
(2) One glycerol and three fatty acid molecules
(3) One glycerol and one fatty acid molecule
(4) Three glycerol and three fatty acid molecules

NEET-II 2016

22. Which of the following is the least likely to be involved in stabilizing the three–dimensional folding of most proteins?
(1) Hydrophobic interaction
(2) Ester bonds
(3) Hydrogen bonds
(4) Electrostatic interaction

23. A non-proteinaceous enzyme is :-
(1) Ligase (2) Deoxyribonuclease
(3) Lysozyme (4) Ribozyme

24. Which of the following describes the given graph **correctly**?



(1) Endothermic reaction with energy A in absence of enzyme and B in presence of enzyme
(2) Exothermic reaction with energy A in absence of enzyme and B in presence of enzyme
(3) Endothermic reaction with energy A in presence of enzyme and B in absence of enzyme
(4) Exothermic reaction with energy A in presence of enzyme and B in absence of enzyme.

NEET (UG) 2017

25. Which of the following are not polymeric ?
(1) Proteins (2) Polysaccharides
(3) Lipids (4) Nucleic acids

26. Which one of the following statements is **correct**, with reference to enzymes ?
(1) Holoenzyme = Apoenzyme + Coenzyme
(2) Coenzyme = Apoenzyme + Holoenzyme
(3) Holoenzyme = Coenzyme + Co-factor
(4) Apoenzyme = Holoenzyme + Coenzyme

NEET (UG) 2018

27. The two functional groups characteristic of sugars are
(1) hydroxyl and methyl
(2) carbonyl and methyl
(3) carbonyl and phosphate
(4) carbonyl and hydroxyl

28. Which of the following is an amino acid derived hormone ?
(1) Epinephrine (2) Ecdysone
(3) Estradiol (4) Estriol

NEET (UG) 2019

29. Which of the following glucose transporters is insulin-dependent ?
(1) GLUT I (2) GLUT II
(3) GLUT III (4) GLUT IV

30. Concanavalin A is :
(1) an alkaloid (2) an essential oil
(3) a lectin (4) a pigment

TG: @Chalnaayaaar

31. Consider the following statements :
(A) Coenzyme or metal ion that is tightly bound to enzyme protein is called prosthetic group.
(B) A complete catalytic active enzyme with its bound prosthetic group is called apoenzyme.
Select the **correct** option.
(1) Both **(A)** and **(B)** are true.
(2) **(A)** is true and **(B)** is false.
(3) Both **(A)** and **(B)** are false.
(4) **(A)** is false and **(B)** is true.

NEET (UG) 2019 (Odisha)

32. Which of the following organic compounds is the main constituent of Lecithin ?
(1) Arachidonic acid (2) Phospholipid
(3) Cholesterol (4) Phosphoprotein

33. "Ramachandran plot" is used to confirm the structure of :-
(1) RNA (2) Proteins
(3) Triacylglycerides (4) DNA

34. Prosthetic groups differ from co-enzymes in that :-
(1) they require metal ions for their activity.
(2) they (prosthetic groups) are tightly bound to apoenzymes.
(3) their association with apoenzymes is transient.
(4) they can serve as co-factors in a number of enzyme-catalyzed reactions.

NEET (UG) 2020

35. Match the following :

(a) Inhibitor of catalytic activity	(i) Ricin
(b) Possess peptide bonds	(ii) Malonate
(c) Cell wall material in fungi	(iii) Chitin
(d) Secondary metabolite	(iv) Collagen

Choose the **correct** option from the following

	(a)	(b)	(c)	(d)
(1)	(ii)	(iii)	(i)	(iv)
(2)	(ii)	(iv)	(iii)	(i)
(3)	(iii)	(i)	(iv)	(ii)
(4)	(iii)	(iv)	(i)	(ii)

TG: @Chalnaayaaar

36. Identify the basic amino acid from the following.
(1) Valine (2) Tyrosine
(3) Glutamic Acid (4) Lysine

37. Which of the following is the most abundant protein in the animals ?
(1) Insulin (2) Haemoglobin
(3) Collagen (4) Lectin

38. Identify the substances having glycosidic bond and peptide bond, respectively in their structure :
(1) Inulin, insulin (2) Chitin, Cholesterol
(3) Glycerol, trypsin (4) Cellulose, lecithin

NEET (UG) 2020 (COVID-19)

39. Identify the statement which is **incorrect**.
(1) Sulphur is an integral part of cysteine.
(2) Glycine is an example of lipids.
(3) Lecithin contains phosphorus atom in its structure.
(4) Tyrosine possesses aromatic ring in its structure.

NEET (UG) 2021

40. Which of the following are **not** secondary metabolites in plants ?
(1) Morphine, codeine
(2) Amino acids, glucose
(3) Vinblastin, curcumin
(4) Rubber, gums

41. Match **List - I** with **List - II.**

List -I		List – II	
(a)	Protein	(i)	C = C double bonds
(b)	Unsaturated fatty acid	(ii)	Phosphodiester bonds
(c)	Nucleic acid	(iii)	Glycosidic bonds
(d)	Polysaccharide	(iv)	Peptide bonds

Choose the **correct** answer from the options given below.

	(a)	(b)	(c)	(d)
(1)	(iv)	(i)	(ii)	(iii)
(2)	(i)	(iv)	(iii)	(ii)
(3)	(ii)	(i)	(iv)	(iii)
(4)	(iv)	(iii)	(i)	(ii)

TG: @Chalnaayaaar

42. Identify the **incorrect** pair.
(1) Alkaloids - Codeine
(2) Toxin - Abrin
(3) Lectins - Concanavalin A
(4) Drugs - Ricin

43. Following are the statements with reference to 'lipids'.
(a) Lipids having only single bonds are called unsaturated fatty acids.
(b) Lecithin is a phospholipid.
(c) Trihydroxy propane is glycerol.
(d) Palmitic acid has 20 carbon atoms including carboxyl carbon.
(e) Arachidonic acid has 16 carbon atoms.
Choose the **correct** answer from the options given below.
(1) (a) and (b) only
(2) (c) and (d) only
(3) (b) and (c) only
(4) (b) and (e) only

NEET (UG) 2022

44. Exoskeleton of arthropods is composed of
(1) Cellulose (2) Chitin
(3) Glucosamine (4) Cutin

45. Read the following statements on lipids and find out correct set of statements:
(a) Lecithin found in the plasma membrane is a glycolipid
(b) Saturated fatty acids possess one or more c = c bonds
(c) Gingelly oil has lower melting point, hence remains as oil in winter
(d) Lipids are generally insoluble in water but soluble in some organic solvents
(e) When fatty acid is esterified with glycerol, monoglycerides are formed
Choose the correct answer from the options given below:
(1) (a), (d) and (e) only
(2) (c), (d) and (e) only
(3) (a), (b) and (d) only
(4) (a), (b) and (c) only

46. A dehydration reaction links two glucose molecules to produce maltose. If the formula for glucose is $C_6H_{12}O_6$ then what is the formula for maltose ?
(1) $C_{12}H_{24}O_{12}$ (2) $C_{12}H_{22}O_{11}$
(3) $C_{12}H_{24}O_{11}$ (4) $C_{12}H_{20}O_{10}$

RE-NEET (UG) 2022

47. Match List - I with List - II :

List - I	List - II
(a) Adenine	(i) Pigment
(b) Anthocyanin	(ii) Polysaccharide
(c) Chitin	(iii) Alkaloid
(d) Codeine	(iv) Purine

Choose the correct answer from the options given below :
(1) (a)–(iv), (b)–(i), (c)–(ii), (d)–(iii)
(2) (a)–(iv), (b)–(iii), (c)–(ii), (d)–(i)
(3) (a)–(iii), (b)–(i), (c)–(iv), (d)–(ii)
(4) (a)–(i), (b)–(iv), (c)–(iii), (d)–(ii)

48. Primary proteins are also called as polypeptides because :
(1) They are linear chains
(2) They are polymers of peptide monomers
(3) Successive amino acids are joined by peptide bonds
(4) They can assume many conformations

49. In the enzyme which catalyses the breakdown of: $H_2O_2 \rightarrow H_2O + O_2$
the prosthetic group is :
(1) Nicotinamide adenine dinucleotide
(2) Haem
(3) Zinc
(4) Niacin

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50. Given below are two statements:

Statement I :

Amino acids have a property of ionizable nature of $-NH_2$ and $-COOH$ groups, hence have different structures at different pH.

Statement II :

Amino acids can exist as Zwitterionic form at acidic and basic pH.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Both Statement-I and Statement-II are correct

(2) Both Statement-I and Statement-II are Incorrect

(3) Statement-I is correct but Statement-II is incorrect

(4) Statement-I is incorrect but Statement-II is correct

ERERCISE-II (Previous Year Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	3	3	3	3	1	3	4	2	3	3	1	1	4	2	4
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	1	3	2	4	3	4	4	4	4	4	1	2	3	2	2
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	2	1	1	2	1	2	2	3	1	4	1	4	3	2	2
Question	46	47	48	49	50										
Answer	2	1	3	2	1										

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Exercise - III Master Your Understanding

EXERCISE-III(A) (NCERT Based QUESTIONS)

1. Which of the following compound is present in acid soluble pool when we analyse chemical composition?
(1) Protein (2) Lipid
(3) Glucose (4) Carotenoid

2. Which of the following elements present most abundantly on earth crust?
(1) Carbon (2) Hydrogen
(3) Oxygen (4) Silicon

3. If $-NH_2$ group and $-COOH$ group are attached on same carbon in any amino acid, then these types of amino acids are known as :
(1) α-AA (2) β-AA
(3) γ-AA (4) All

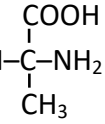
4. Variations in amino acids depend on :
(1) Side group
(2) Ester group
(3) Complexity of cell
(4) None of them

5. How many carbon atoms are found in arachidonic acid?
(1) 16 (2) 18 (3) 20 (4) 22

6. Which of the following AA is basic ?
(1) Valine (2) Lysine
(3) Glutamic acid (4) Glycine

7. How many total carbons are found in palmitic acid?
(1) 15 (2) 16 (3) 17 (4) 18

8. Lipid may be :
(1) Monoglyceride (2) Diglyceride
(3) Triglyceride (4) All the above

9.  This amino acid is :
(1) Serine (2) Alanine
(3) Glycine (4) Arginine

10. Which functional group is common in fatty acid & amino acid ?
(1) $-COOH$ (2) $-NH_2$
(3) $-OH$ (4) All

11. In proteins, amino acids are attached together by :
(1) Peptide bond (2) Amide bond
(3) Ester bond (4) 1 & 2 both

12. Proteins can act as :
(1) transporter of nutrients across cell membrane
(2) Hormones
(3) Enzymes
(4) All

13. Which of the following is homopoly-saccharide?
(1) Cellulose (2) Starch
(3) Glycogen (4) All

14. All the elements present in a sample of earth's crust are also present in a sample of living tissue, but which of the following element is higher in any living organism than in earth's crust?
(1) Hydrogen, Oxygen, Carbon and Silicon.
(2) Hydrogen, Oxygen, Carbon, Nitrogen and Silicon
(3) Hydrogen, Oxygen, Carbon, Nitrogen and Sulphur.
(4) Hydrogen, Oxygen, Carbon, Nitrogen, Sulphur and Sodium

15. Pigments are considered as the secondary metabolites, having some particular functions. Which of the following is an example of pigments?
(1) Carotenoids (2) Codeine
(3) Concanavalin-A (4) Curcumin

16. Which of the following can not be considered as the example of polymeric substances?
(1) Rubber (2) Gums
(3) Cellulose (4) Vinblastin

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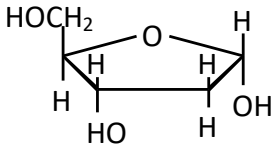
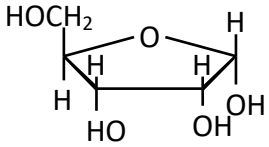
17. Select the correctly matched.
(1) Anthocyanins - Alkaloids
(2) Carotenoids - Toxins
(3) Ricin - Drugs
(4) Lemon grass oil - Essential oils.

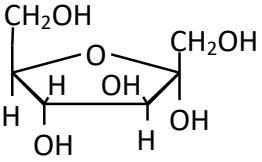
18. Which of the following amino acid having H(Hydrogen) as R group?
(1) Glycine (2) Alanine
(3) Serine (4) Leucine

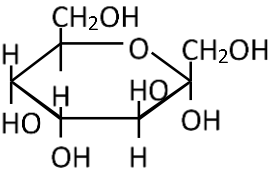
19. Physical and chemical properties of amino acids depend on
(1) Amino group
(2) Carboxylic group
(3) R-group
(4) All of the above

20. Which of the following represents the structure of Ribose ?

(1) 

(2) 

(3) 

(4) 

21. Enzymes, which catalyse the transfer of hydrogen (H) between two substrates, are called:-
(1) Transferases (2) Oxidoreductases
(3) Isomerases (4) Hydrolases

22. Which of the following statements is **correct**?
(1) All the proteins are enzymes
(2) All enzymes are proteins
(3) Almost all enzymes are proteins
(4) All enzymes are nucleic acids

23. Low temperature preserves the enzyme in a ...'A'... state whereas high temperature destroys enzymatic activity because proteins are ...'B'... by heat.
Choose the **correct** option:-
(1) A = temporarily inactive, B = denatured
(2) A = permanently inactive,
B = temporarily inactive
(3) A = permanently inactive, B = denatured
(4) A = denatured, B = temporarily inactive

24. Which of the following is not correct?
(1) Catabolic pathways lead to the release of energy
(2) Anabolic pathways consume energy
(3) The living state and metabolism are synonymous
(4) CO_2 dissolving in water is an uncatalysed reaction in living systems

25. Which of the following is not a correct match?
(1) Acetic acid $\rightarrow$ Cholesterol = Anabolic
(2) Hydrolysis of glycosidic bond = Catabolic
(3) Amino acid $\rightarrow$ Protein = Anabolic
(4) Glucose $\rightarrow$ Lactic acid = Anabolic

26. A general rule of thumb is that rate of enzymatic reactions doubles or decreases by half for every ___ change in either direction.
Choose correct option for above blank.
(1) 50° (2) 5°C
(3) 100°C (4) 10°C

27. Non proteinaceous part of holoenzyme can be:-
(1) metal ion (2) prosthetic group
(3) Coenzyme (4) All of the above

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28. Which of the following can have catalytic power?

(1) Protein (2) Nucleic acid

(3) Fat (4) Both (1) and (2)

29. Catalytic activity is lost when the co-factor is removed from the enzyme. It testifies that :-

(a) Cofactors form one or more coordination bonds with enzymes.

(b) Cofactors play a crucial role in the catalytic activity of the enzyme

(c) Cofactors are not made up of proteins

(d) Cofactors show permanent association with enzymes

Options :

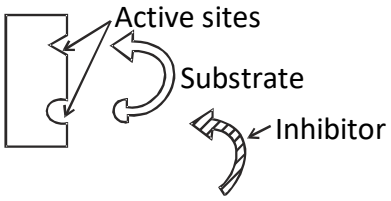
(1) (a) and (d)

(2) (2) Only (b)

(3) (b) and (c)

(4) (4) (a), (b) and (c)

30.



Above diagram is the indicative diagram of a type of inhibition. Choose the correct match:-

	Type of inhibition	Substrate	Inhibitor
(1)	Non competitive reversible	Malonate	Succinate
(2)	Competitive	Succinic dehydrogenase	Malonate
(3)	Non competitive irreversible	Succinic dehydrogenase	Succinate
(4)	Competitive	Succinate	Malonate

31. On the basis of type of reactions they catalyse, enzymes are divided into _____ classes each with ___ subclasses.

Choose the **correct** numbers for above blanks respectively from the following options :-

(1) 6,6 (2) 6, 4–13

(3) 4–13, 6 (4) 4, 13

32. Inorganic catalysts work efficiently at high temperatures while enzymes get damaged at high temperatures (above 40°C). This feature of enzymes in not applicable to :-

(1) the enzymes which are made up of proteins

(2) The enzymes isolated from thermophobic organisms

(3) the enzymes which have active sites

(4) the enzymes of organisms who live in hot vents

33. In the absence of any enzyme, reaction $CO_2 + H_2O \longrightarrow H_2CO_3$ is very slow, formation of 200 molecules of H_2CO_3 per hour. However by the use of carbonic anhydrase enzyme reaction speeds with about :-

(1) formation of 6×10^5 molecules of H_2CO_3 every second

(2) formation of 36×10^5 molecules of H_2CO_3 every minute

(3) formation of 36×10^6 molecules of H_2CO_3 every second

(4) formation of 6×10^6 molecules of H_2CO_3 every minute

34. Stability is something related to energy status of the molecule. Transition state is high energy state as compare to substrate. So we can conclude that :-

(1) Transition state is more stable than substrate

(2) substrate is more stable than transition state

(3) Both substrate and transition state are very much unstable

(4) Stability can not be compared

35. The activity of an enzyme can be affected by a change in the conditions which can alter the:-

(1) tertiary structure of nucleic acids

(2) primary structure of fats

(3) tertiary structure of proteins

(4) secondary structure of carbohydrates

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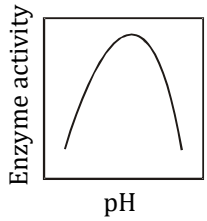
36. Which of the following statements is **not correct** regarding enzymes ?
(1) They are specific in nature
(2) They are used up in reaction
(3) They are proteinaceous in nature
(4) They speed up the rate of biochemical reactions.

37. Which of the following statements regarding cofactors is **not correct** ?
(1) Every coenzyme is a cofactor but every cofactor is not a coenzyme
(2) Catalytic activity is lost when the cofactor is removed from the enzyme
(3) Every coenzyme is a cofactor and every cofactor is a coenzyme
(4) In the catalase enzyme, haem group work as a cofactor

38. The prosthetic group can be distinguished from other cofactors of enzymes because prosthetic groups :-
(1) are organic in nature
(2) are tightly bound to the apoenzyme
(3) Both (1) and (2)
(4) are inorganic in nature and are loosely bound to the apoenzyme

39. Ribozymes are :-
(1) Enzymes with tertiary structure of protein
(2) Fragments of endoplasmic reticulum those contain ribosomes
(3) Inorganic enzymes
(4) Nucleic acids that behave like enzymes

40. Represented below is the effect of change in pH on enzyme activity. Which one of the following conclusions can be made by this diagram ?



(1) Enzyme show its highest activity at a particular pH, both below and above this pH, activity declines
(2) With increasing pH, activity increases upto a limit then it become constant
(3) At a particular pH, activity is minimum, both below and above this pH, activity increases
(4) Enzyme activity is affected by temperature not by pH so it is completely a hypothetical graph

41. Match the column-I with column-II :-

Column-I (Example)		Column-II (Type of cofactor)	
(A)	NAD with dehydrogenase enzyme	(i)	Metal ion
(B)	Zn with carboxypeptidase enzyme	(ii)	Prosthetic group
(C)	Haem group with catalase enzyme	(iii)	Coenzyme

Choose the option from the following which denotes correct match of column-I with column-II :-
(1) A–i, B–ii, C–iii
(2) A–iii, B–ii, C–i
(3) A–iii, B–i, C–ii
(4) A–ii, B–iii, C–i

42. $CO_2 + H_2O \xrightarrow{B} A$
Choose the correct option for A and B in the given reaction :-
(1) B-Product of this reaction, A-Enzyme of this reaction
(2) A-Product of this reaction, B-Rate of formation of product of this enzyme is 360 lakh molecules/sec.
(3) A-Carbonic acid, B- Rate of formation of product of this enzyme is 6,00,000 molecules/sec.
(4) A-Transient state, B-Enzyme of this reaction

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43. Which of the following statements is not correct ?

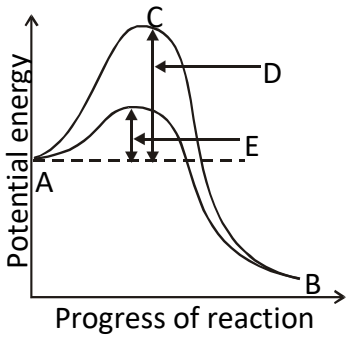
(1) Enzymes bring down the activation energy of the processes

(2) Enzymes are preserved in a temporary inactive state at high temperature

(3) Enzymes isolated from thermophilic organisms have thermal stability

(4) Enzymes are differ from inorganic catalysts because enzymes get *damaged* at high temperature.

44.



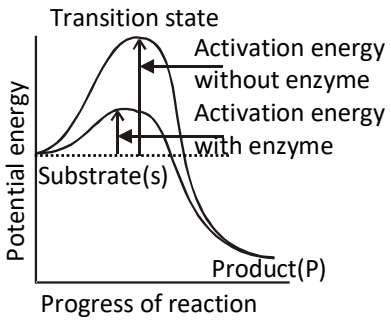
(1) Energy level of A is low as compared to B

(2) Energy level of B is high as compared to C

(3) Energy level of D is high as compared to E

(4) Energy level of C is low as compared to A and B

45.



Above diagram showing the concept of activation energy. If in this diagram energy level of 'P' become higher than the energy level of 'S' then which of the following will not apply for this diagram ?

(1) The process will be endothermic

(2) Activation energy with enzyme will be less than activation energy without enzyme

(3) Energy difference between transition state and product will be more than activation energy

(4) The substrate will go through the transition state

46. (i) Transient association with the protein part of conjugated enzyme

(ii) Non protein organic substance

(iii) Usually made up of vitamins

All the above characters are applicable to :-

(1) Apoenzyme (2) Holoenzyme

(3) Coenzyme (4) Isoenzyme

47. An enzyme catalysing a transfer of a group, G between a pair of substrate S and S' as follows:

$S - G + S' \longrightarrow S + S' - G$

G = phosphate or hydrogen or any other group, the enzyme is related with which of the following class?

(1) Transferases (2) Dehydrogenases

(3) Both (1) and (2) (4) Either (1) or (2)

EXERCISE-III(B) (ANALYTICAL QUESTIONS)

48. Which element is present negligible in human body?

(1) O (2) C (3) H (4) Si

49. Which of the following compound is found in acid soluble pool during analysis of a living tissue?

(1) Protein (2) Lipid

(3) Polysaccharide (4) Monosaccharide

50. Which of the following is not a macromolecule?

(1) Amino acid (2) Nucleotide

(3) Monosaccharide (4) All the above

51. α-amino acids are those, which –

(1) Participates in protein synthesis

(2) –COOH group and $-NH_2$ group are attached on same carbon

(3) 20 types

(4) All the above are correct

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52. Which of the following is correct statement?
(1) Amino acids may be considered as substituted methane
(2) α-AA have difference only in R group
(3) In serine, R-group is hydroxy methyl
(4) All the above

53. What is the R group in Glycine?
(1) $-CH_2-OH$ (2) $-H$
(3) $-CH_3$ (4) None of them

54. Which of the following is acidic amino acid?
(1) Valine (2) Glutamic acid
(3) Arginine (4) Lysine

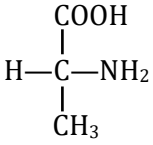
55. Which of the following is aromatic AA?
(1) Tyrosine (2) Tryptophan
(3) Phenyl alanine (4) All the above

56. Which of the following is component of simple lipid?
(1) Glycerol (2) Glycol
(3) Fatty acid (4) both 1 & 3

57. The lipid which is found in cell membrane is
(1) Phospholipid (2) Lecithin
(3) 1 & 2 both (4) Palmitic acid

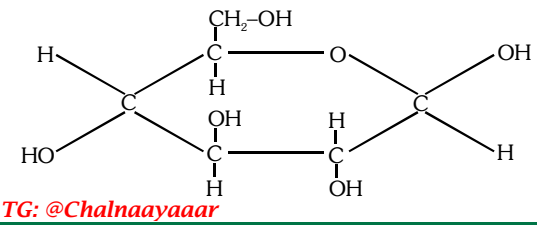
58. Heterocyclic ring is found in which compound?
(1) N-bases
(2) Ring structure of monosaccharides
(3) Protein
(4) 1 & 2 both

59. Following structure is related to which AA?



(1) Glycine (2) Alanine
(3) Serine (4) Tyrosine

60. Following structure is –



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(1) α-Glucose
(2) β-Glucose
(3) Ribose
(4) Deoxyribose

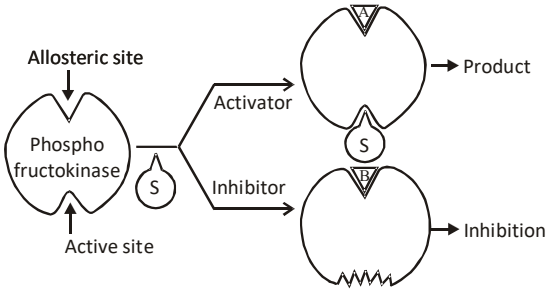
61. Which of the following is secondary metabolites?
(1) Rubber
(2) Alkaloids
(3) Terpenoids
(4) All the above

62. Which of the following statement is correct?
(1) Lipid is biomacromolecule
(2) Lipid has <1000 daltons molecular weight
(3) Proteins are heteropolymer
(4) All the above are correct except (1)

63. DNA is –
(1) Biomacromolecule
(2) Acidic in nature
(3) Polymer of nucleotide
(4) All the above

64. All the following statements about the structure of glycogen are true, except :-
(1) Branched chains occur, after every ten residues
(2) It is a copolymer of glucose and mannose
(3) It contains α–1, 4–glycosidic linkages
(4) It contains α–1, 6–glycosidic linkages

65.



In the following diagrammatic representation A and B is :-
(1) A → G-6-P, B → ATP
(2) A → AMP, B → ATP
(3) A → Fructose-6-P, B → ATP
(4) A → ATP, B → ADP

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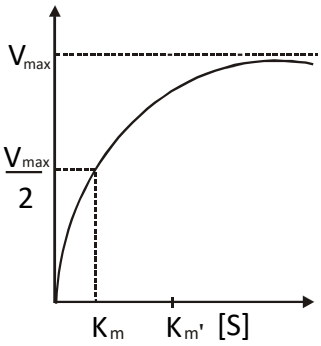
66.



Above graph is showing the effect of substrate concentration (S) on enzymatic activity. If due to change in enzymatic activity K_m value changes to K_m , then which of the following can be conclude on the basis of this change?

(1) There is a significant increase in enzymatic activity

(2) Entry of positive allosteric modulator in enzymatic activity

(3) Entry of non-competitive inhibitor in enzymatic activity

(4) In enzymatic activity, entry of inhibitor which closely resembles the substrate in its molecular structure

67. One molecule of enzyme convert 5 molecules of substrate into product in 5 minutes. 20 molecules of substrate and two molecules of enzyme are mixed in a test tube. After 10 minutes the test tube will have :-

(1) products and 10 unreacted molecules of substrate

(2) only products

(3) 10 unreacted molecules of substrate, enzymes and products

(4) products and enzymes

EXERCISE - III ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	3	3	1	1	3	2	2	4	2	1	4	4	4	3	1
Question	16	17	18	19	20	38	39	40	41	42	43	44	45	46	47
Answer	4	4	1	4	2	2	3	1	4	4	4	4	4	2	4
Question	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62
Answer	2	4	1	2	3	2	3	2	4	1	3	3	2	3	3
Question	63	64	21	22	23	24	25	26	27	28	29	30	31	32	33
Answer	3	4	4	4	4	4	4	2	2	4	4	3	4	2	2
Question	34	35	36	37	65	66	67								
Answer	4	4	4	2	2	4	4								

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Important Notes